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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/398,652 | 09/17/1999 | WILLIAM A. SAMARAS | 042390.P5120D | 1359 |

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07/03/2003

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EXAMINER

CHANG, RICK KILTAE

ART UNIT

PAPER NUMBER

3729

DATE MAILED: 07/03/2003

31

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 09/398,652 | Applicant(s) SAMARAS ET AL. ad | |
| | Examiner Rick K. Chang | Art Unit 3729 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19, 21, 22 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) that are not recited in Item 6 below is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19, 21 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 19, 21, and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 19, lines 13-14 is only partially supported by the disclosure. The disclosure, as originally filed, fails to provide support whether the testing is performed on the pads or the solder balls mounted thereon. Further, the disclosure is clear that it is the “only preselected pads” are tested, not “selected pads”.

NOTE: Please provide reference numerals to all the claimed limitations as well as support in the disclosure for better clarity. Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 19, 21 and 26, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Seidel (US 5,635,847) in view of Gedney et al (US 5,483,421), and further in view of Beers (US 5,680,936), Degani et al (US 5,990,564) and Hamzehdoost et al (US 5,689,091).

Re claim 19: Seidel discloses providing an interposer (10); coupling solder balls (12) to the interposer (10) to selected locations; coupling a plurality of semiconductor dice (11) to the first surface (the surface where 11s are mounted); and testing the plurality of semiconductor dice (11) on the interposer (col. 1, lines 20-34 and col. 2, lines 46-51).

Seidel fails to disclose populating the second surface with a plurality of conductive pads; coupling the solder ball to each of selected ones of the plurality of conductive pads; coupling a plurality of cache memory devices and at least one passive device to the first surface; coupling the interposer to a substrate with the solder balls after the testing if the plurality of semiconductor dice pass the testing; testing only a portion of the selected ones of the pads; not coupling solder balls to non-selected locations; and coupling a microprocessor device to the substrate.

Gedney discloses populating the second surface with a plurality of conductive pads (32); coupling a solder ball (44) to each of selected ones of the plurality of conductive pads (32); coupling the interposer (24) to a substrate (38) with the solder balls (44); testing only a portion of the selected ones of the pads (Fig. 6 shows 16 is touching 34 not another 12); and coupling at least one other semiconductor device (Fig. 4 shows a third semiconductor device (20 and 24) is mounted on 38) to the substrate (38) thereby forming a multi-chip subassembly and mounting this subassembly to printed circuit cards (col. 1, lines 7-8) without any defective components.

Beers discloses coupling at least one passive device (see annotated Fig. 3 below) thereby regulating voltage and current to the electronic dice.

Hamzehdoost discloses not coupling solder balls to non-selected locations (the conductive metal layer 30 is covered with a compatible material, except for selective solderable areas 36 where it is desired to have the solder balls applied (col. 3, lines 47-450) and see col. 3, lines 61-63) thereby saving production cost and making the package lighter for saving fuel cost.

Degani discloses mounting a plurality of cache memory devices and a microprocessor device on an interposer to use in a computer to perform computation and temporarily store program applications.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by populating the second surface with a plurality of conductive pads; coupling the solder ball to each of selected ones of the plurality of conductive pads; coupling the interposer to a substrate with the solder balls after the testing if the plurality of semiconductor dice pass the testing; testing only a portion of the selected ones of the pads; and coupling at least one other semiconductor device to the substrate, as taught by Gedney, for the purpose of forming

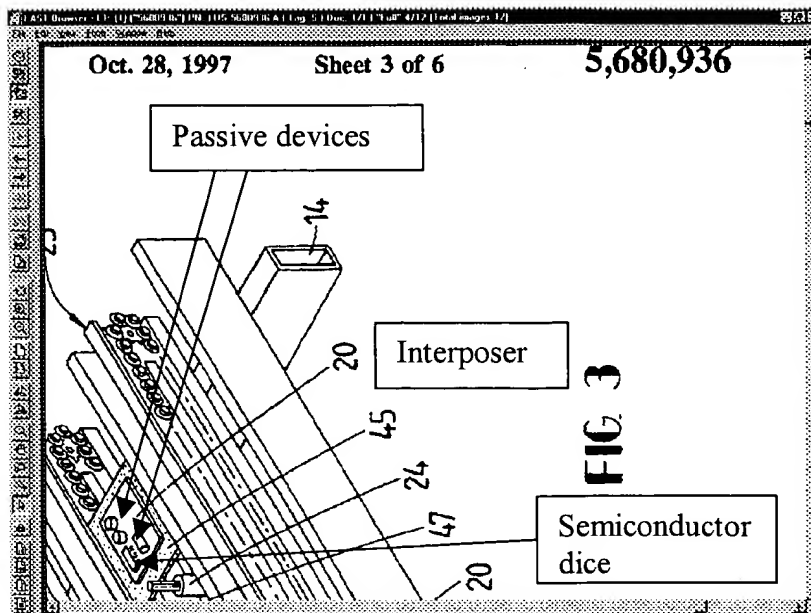
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a multi-chip subassembly and mounting this subassembly to printed circuit cards without any defective components.

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by not coupling solder balls to non-selected locations, as taught by Hamzehdoost, for the purpose of saving production cost and making the package lighter for saving fuel cost.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by coupling at least one passive device to the first surface of the interposer, as taught by Beers, for the purpose of regulating voltage and current to the electronic chip.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by mounting a plurality of cache memory devices and a microprocessor device, as taught by Degani, to use in a computer to perform computation and temporarily store program applications.



Re claim 21: Seidel teaches the invention as described with respect to claim 19 above.

Seidel fails to disclose providing the interposer having organic material.

Gedney discloses providing the interposer (24) having organic material (col. 7, lines 15-16) thereby providing low thermal coefficient of expansion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by providing the interposer having organic material, as taught by Gedney, for the purpose of providing low thermal coefficient of expansion.

Re claim 26: Seidel teaches the invention as described with respect to claim 19 above.

Seidel fails to disclose creating a plurality of contacts on the substrate; and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts.

Gedney discloses creating a plurality of contacts (42) on the substrate (38); and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts (Fig. 5 shows conductive pads 32 are electrically connected to the contacts 42 via solder

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balls 44) thereby allowing signal to travel from one part of the component to another and providing power and ground to the device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seidel by creating a plurality of contacts on the substrate; and electrically connecting the selected ones of the plurality of conductive pads to the plurality of contacts, as taught by Gedney, for the purpose of allowing signal to travel from one part of the component to another and providing power and ground to the device.

NOTE: Please provide reference numerals to all the claimed limitations as well as support in the disclosure for better clarity. Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.

Response to Arguments

6. Applicant's arguments filed 5/7/03 have been fully considered but they are not persuasive.

It makes good sense and good claim practice to positively recite the recitation of providing an interposer (first step) rather than jumping right into the second step.

Examiner suggests the applicants' representative do a search for the terms "Markush Groups" in the MPEP to determine who is correct in this matter. See *Ex parte Markush*, 1925 C.D. 126 (Comm'r Pat. 1925).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., testing only a portion of those conductive pads that have solder balls attached) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Gedney discloses testing only a portion of the selected ones of the pads (Fig. 6 shows 16 is touching 34 not another 12).

NOTE: Please provide reference numerals to all the claimed limitations as well as support in the disclosure for better clarity. Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.

Interviews After Final

7. Applicant note that an interview after a final rejection will not be granted unless the intended purpose and content of the interview is presented briefly, in writing (the agenda of the interview must be in writing) to clarify issues for appeal requiring only nominal further consideration. Interviews merely to restate arguments of record or to discuss new limitations will be denied. See MPEP 714.13 and 713.09.

Conclusion

8. Please provide reference numerals to all the claimed limitations as well as support in the disclosure for better clarity. Applicants are duly reminded that a full and proper

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response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick K. Chang whose telephone number is (703) 308-4784. The examiner can normally be reached on 5:30 AM to 1:30 PM, Monday through Friday, except for maxi-flex day off (any one of working days).


The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke, positioned above a solid horizontal line.

**RICHARD CHANG
PRIMARY EXAMINER**

RC
July 2, 2003